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UTILITY PATENT APPLICATION TRANSMITTAL <small>(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))</small>	Attorney Docket No.	CP0001US
	First Inventor or Application Identifier	Hung
	Title	CONFIGURABLE ELECTRONIC REDEEMABLE
	Express Mail Label No.	EI629120045US

APPLICATION ELEMENTS <small>See MPEP chapter 600 concerning utility patent application contents.</small>	ADDRESS TO: Assistant Commissioner for Patents Box Patent Application Washington, DC 20231
1. <input checked="" type="checkbox"/> * Fee Transmittal Form (e.g., PTO/SB/17) <small>(Submit an original and a duplicate for fee processing)</small> 2. <input checked="" type="checkbox"/> Specification [Total Pages 15] <small>(preferred arrangement set forth below)</small> - Descriptive title of the invention - Cross References to Related Applications - Statement Regarding Fed sponsored R & D - Reference to Microfiche Appendix - Background of the invention - Brief Summary of the invention - Brief Description of the Drawings (if filed) - Detailed Description - Claim(s) - Abstract of the Disclosure 3. <input checked="" type="checkbox"/> Drawing(s) (35 U.S.C. 113) [Total Sheets 4] 4. Oath or Declaration [Total Pages 19] a. <input checked="" type="checkbox"/> Newly executed (original or copy) b. <input type="checkbox"/> Copy from a prior application (37 C.F.R. § 1.63(d)) <small>(for continuation/divisional with Box 16 completed)</small> i. <input type="checkbox"/> DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).	5. <input type="checkbox"/> Microfiche Computer Program (Appendix) 6. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary) a. <input type="checkbox"/> Computer Readable Copy b. <input type="checkbox"/> Paper Copy (identical to computer copy) c. <input type="checkbox"/> Statement verifying identity of above copies
ACCOMPANYING APPLICATION PARTS	
7. <input type="checkbox"/> Assignment Papers (cover sheet & document(s)) 8. <input type="checkbox"/> 37 C.F.R. § 3.73(b) Statement <input type="checkbox"/> Power of Attorney <small>(when there is an assignee)</small> 9. <input type="checkbox"/> English Translation Document (if applicable) 10. <input checked="" type="checkbox"/> Information Disclosure Statement (IDS)/PTO-1449 <input checked="" type="checkbox"/> Copies of IDS Citations 11. <input type="checkbox"/> Preliminary Amendment 12. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) <small>(Should be specifically itemized)</small> 13. <input checked="" type="checkbox"/> * Small Entity Statement(s) <input type="checkbox"/> Statement filed in prior application, Status still proper and desired (PTO/SB/09-12) 14. <input type="checkbox"/> Certified Copy of Priority Document(s) (if foreign priority is claimed) 15. <input type="checkbox"/> Other:	

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16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: _____ / _____

Prior application information: Examiner _____ Group / Art Unit: _____

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

☒ Customer Number or Bar Code Label  or ☐ Correspondence address below
(Insert Customer No. or Attach bar code label here)

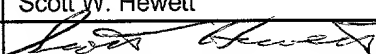
022849

Name _____

Address _____

City _____ State _____ Zip Code _____

Country _____ Telephone _____ Fax _____

Name (Print/Type)	Scott W. Hewett	Registration No. (Attorney/Agent)	41,836
Signature		Date	July 26, 2000

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**STATEMENT CLAIMING SMALL ENTITY STATUS
 (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR**

Docket Number (Optional)
 CP0001US

Applicant, Patentee, or Identifier: HUNG, Patrick S.

Application or Patent No.: _____

Filed or Issued: filed herewith

Title: Configurable Electronic Redeemable Coupon

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

- ☒ the specification filed herewith with title as listed above.
- ☐ the application identified above.
- ☐ the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☐ No such person, concern, or organization exists.
- ☒ Each such person, concern, or organization is listed below.

CPO Technologies Corporation

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

Patrick S. Hung

NAME OF INVENTOR

NAME OF INVENTOR

NAME OF INVENTOR

Signature of Inventor

Signature of Inventor

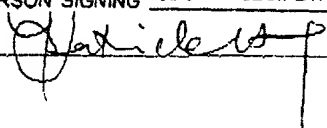
Signature of inventor

Date

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STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(c))--SMALL BUSINESS CONCERN		Docket Number (Optional) CP0001US
Applicant, Patentee, or Identifier: <u>Hung, Patrick</u>		
Application or Patent No.: _____		
Filed or Issued: <u>filed herewith</u>		
Title: <u>Configurable Electronic Redeemable Coupon</u>		
I hereby state that I am <input type="checkbox"/> the owner of the small business concern identified below. <input checked="" type="checkbox"/> an official of the small business concern empowered to act on behalf of the concern identified below.		
NAME OF SMALL BUSINESS CONCERN <u>CPO Technologies Corporation</u>		
ADDRESS OF SMALL BUSINESS CONCERN <u>528 Weddell Drive, Suite No. 5, Sunnyvale, CA 94089</u>		
I hereby state that the above identified small business concern qualifies as a small business concern as defined in 13 CFR Part 121 for purposes of paying reduced fees to the United States Patent and Trademark Office. Questions related to size standards for a small business concern may be directed to: Small Business Administration, Size Standards Staff, 409 Third Street, SW, Washington, DC 20418.		
I hereby state that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention described in: <input checked="" type="checkbox"/> the specification filed herewith with title as listed above. <input type="checkbox"/> the application identified above. <input type="checkbox"/> the patent identified above.		
If the rights held by the above identified small business concern are not exclusive, each individual, concern, or organization having rights in the invention must file separate statements as to their status as small entities, and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).		
Each person, concern, or organization having any rights in the invention is listed below: <input checked="" type="checkbox"/> no such person, concern, or organization exists. <input type="checkbox"/> each such person, concern, or organization is listed below.		
Separate statements are required from each named person, concern or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)		
I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))		
NAME OF PERSON SIGNING <u>Patrick S. Hung</u>		
TITLE OF PERSON IF OTHER THAN OWNER <u>Chief Executive Officer</u>		
ADDRESS OF PERSON SIGNING <u>528 Weddell Drive, Suite No. 5, Sunnyvale, CA 94089</u>		
SIGNATURE <u></u>		DATE <u>7/26/00</u>

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Date of Deposit: July 26, 2000
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Assistant Commissioner for Patents
Box PATENT APPLICATION
Washington, DC 20231

By: 

FROM: Scott W. Hewett
400 West Third Street, No. 223
Santa Rosa, CA 95401
Customer No. 022849
(707) 591-0789

TO: Assistant Commissioner for Patents
Box PATENT APPLICATION
Washington, DC 20231

Dear Sir:


Transmitted herewith for filing under 35 USC 1111 and 37 CFR 1.53(b) is the utility patent application of:

Inventor: Patrick S. Hung
For: CONFIGURABLE REDEEMABLE ELECTRONIC COUPON

Enclosed are:

- a Utility Application Transmittal form
- a Fee Transmittal sheet with authorization to charge the filing and excess claims fee to Deposit Account No. 50-0891
- a copy of the Fee Transmittal sheet
- a signed Statement Claiming Small Entity Status under 37 CFR 1.9(f) and 1.27(b)
- a signed Statement Claiming Small Entity Status under 37 CFR 1.9(f) and 1.27(c)
- a title page
- 15 pages of specification, including description (10), claims(4), and abstract (1)
- 4 sheets of informal drawings
- a copy of the signed Declaration and Power of Attorney
- an Information Disclosure Statement with
 - substitute Form 1449A (1 sheet)
 - copies of 5 references
- a stamped Return Receipt Postcard addressed to the undersigned

Respectfully submitted:


Scott W. Hewett
Reg. No. 41,836
Attorney for Applicant

Tel: (707) 591-0789

PATENT APPLICATION
for
CONFIGURABLE ELECTRONIC REDEEMABLE COUPON

Inventors: Patrick Siu-ying Hung, a citizen of the United States of America
residing at:
19291 De Havilland, Saratoga
California 95070

Status: Small Entity

Assignee: CPO Technologies Corporation,
a California corporation,
having a principle place of business at:
528 Weddell Drive, Suite No. 5
Sunnyvale, California 94089

Patent Attorney:
Scott Hewett
400 West Third Street, No. 223
Santa Rosa, CA 95401
Tel: 707-591-0789
Fax: 707-591-0392

CONFIGURABLE ELECTRONIC REDEEMABLE COUPON

5

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

10

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

15

REFERENCE TO MICROFICHE APPENDIX

Not Applicable

BACKGROUND OF THE INVENTION

20 The present invention is related generally to redeemable coupons for use by a consumer at a point-of-sale ("POS"), and more particularly to methods and apparatus for generating a computer-readable coupon on a display of a portable electronic device.

Coupons for use by a consumer are used in a variety of fashions. Coupons might provide a fixed amount off of a sale price, a percentage discount, or free merchandise, for example. Merchandisers use coupons for a variety of purposes. A manufacturer of a
25 product might provide a coupon with a product package for a discount on the next purchase of the same or a different product, or a retailer might provide a coupon in a newspaper or other printed medium to encourage a consumer to shop at his store, for example. A retailer might also print a coupon out at the time of sale for a purchaser, according to what the purchaser bought, to encourage that purchaser to return to the store, buy a related good, and/or to buy
30 more of the same goods.

With the introduction of scanning devices at check-out counters, coupons typically now have a computer-readable field on them so that the coupon information, such as product type, manufacturer identification and discount, can be automatically entered. This

field is often a "bar code", and is read by a laser scanner. The scanner can also read bar codes on the labels of the products being purchased, such as UPC (Universal Product Code), thus the process of applying the coupon discounts to the appropriate merchandise is less cumbersome than when the check-out clerk had to enter each coupon amount into the cash register through a keyboard.

However, paper coupons can be both inconvenient and ineffective. A consumer might not save the coupon, might forget to bring it with him to the store, or not be able to find it. The inability to receive a discount the consumer knows is available with the missing coupon might actually deter a purchase. Many consumers find coupons bothersome in that the coupons can create clutter. Furthermore, it can be inconvenient while waiting at the check-out counter to sort through a stack of coupons to find the one applicable to the purchase, and other consumers standing in line waiting to be served might become impatient waiting for the purchaser to find his coupons. Finally, while product bar codes and scanning protocol are generally consistent within a geographic region, some coded coupons might not work out of the area in which they were produced for. In addition, retail merchants face additional burdens and challenges related to monitoring and tracking coupons to reduce fraud and ensure proper discounting and redemption policies.

Thus, there is a need for a coupon and redemption techniques that overcome the above difficulties.

SUMMARY OF THE INVENTION

The present invention provides a portable electronic device capable of generating configurable computer-readable coupons on a display. Coupon information is stored in the device, or is transmitted to the device over a wireless network, or generic coupon data is transmitted to the device and locally formatted to the display, for example. The device can store many coupons at one time, and present them in serial fashion to a scanning device, such as a light pen, charge-coupled diode array, or laser scanner. In addition to product information, the coupon can display expiration dates, offer codes, value codes, serialized identification numbers, and customer information, such as customer identification, and issuer or redeemer information.

In a further embodiment, the coupon information has an automatic expiration feature that deletes itself from memory in the portable electronic device after expiration. In a particular embodiment, the display is a dot-matrix type of display with persistent pixels that stay darkened between strobe signals used to activate the pixel.

5

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1A is a simplified block diagram of a portable electronic device illustrated in a wireless communication system according to an embodiment of the present invention;

Fig. 1B is a simplified front view of a bar code coupon generated on the
10 display of the device illustrated in Fig. 1A.

Fig. 2A is a simplified flow chart of a coupon configuration process according to an embodiment of the present invention;

Fig. 2B is a simplified flow chart of another process according to the present
invention;

Fig. 2C is a simplified flow chart of another coupon configuration process
15 according to another embodiment of the present invention;

Fig. 2D is a simplified diagram of a data structure according to an embodiment of the present invention; and

Fig. 3 is a simplified flow chart of a process for redeeming a coupon according
20 to an embodiment of the present invention.

WRITTEN DESCRIPTION OF SPECIFIC EMBODIMENTS

1. Introduction

The present invention provides scannable coupons on the display of a portable
25 electronic device, such as a wireless telephone ("cell phone"), or wireless personal digital assistant ("PDA"), or handheld computer. The scannable coupons are presented as a bar code or similar optically readable characters. In one embodiment, the device combines product information transmitted to the device by the coupon provider with coupon user information. In one embodiment, the device has a liquid crystal display ("LCD") with enhanced resolution
30 to produce scannable coupons for use with standard scanners. In another embodiment, the

device has an LCD with typical resolution and configures scannable coupons for use with scanning systems requiring less resolution.

In a further embodiment, coupon information is automatically sent to the portable electronic device. The coupon information can be sent as a result of a subscriber service that the user belongs to, or as a result of user purchases, for example. The coupon information is stored in local memory and used to generate the scannable display. Other information, such as appropriate product code type and consumer information, is also encoded on the scannable display. In yet a further embodiment, text associated with the user product is displayed concurrently with the scannable field of the display.

10

2. Portable Electronic Devices

Figure 1A is a simplified block diagram of a portable electronic device 10 in a wireless communication system 12 according to an embodiment of the present invention. The portable electronic device is a consumer-level product such as a cell phone, pager, PDA or similar device that generally has a power supply 14 (such as a battery or fuel cell), a processor 16, memory 18 (which can be integrated with the processor), and a display 20. A receiver 22, such as a wireless modem, coupled to an antenna 24 receives information broadcast from a transmitter 26 that is connected to a server 28 or similar device. The receiver typically also has transmitting capability, but this is not required in all embodiments, such as a pager embodiment. The transmitter typically also has receiving capability, but this is not required in all embodiments. This information can be processed by the processor and sent to various destinations, such as to a speaker (not shown), to the display, or stored in memory. The portable device also has a user input 17, such as a keypad and/or buttons.

The memory 18 may be random access memory ("RAM"), flash memory, magnetic memory, such as a magnetic disk, complementary metal-oxide-semiconductor ("CMOS") memory, or combinations of these and/or other memory. A computer-readable program 30 stored in the memory contains instructions for configuring the device according to the present invention. The memory typically also contains data 32 for use with the instructions. The program 30 contains instructions for rendering a coupon in a scannable format to the display according to received coupon information, and may further include instructions for converting one barcode format to another.

30

A signal, represented by the dashed line 34, is sent from the transmitter 26 to the receiver 22. The signal contains information used to generate a computer-readable coupon on the display 20 of the device, and could contain other information such as an expiration date, issuer identification, offer code, serialized identification numbers, value codes and user information. For example, the signal could contain information for generating a universal product code coupon code ("UPC Coupon Code") barcode and/or a UCC/EAN-128 barcode additional bars relating to the nature of the coupon, for example a percentage discount on the product, in addition to a code segment relating to the expiration date of the coupon. In another embodiment, the signal contains generic product information and the portable device translates the generic product information into an appropriate bar code, such as a UPC barcode, UPC Coupon Code, UCC/EAN-128 barcode or a CODE 49 barcode. Thus, the server could transmit generic product information to the user's device, and the device would configure the scannable coupon for the appropriate market.

Consider the user that travels internationally. A paper coupon generated in a store in California might not be usable in Hong Kong. Thus, the desires of both the coupon issuer and the consumer might be frustrated. However, devices according to the present invention might overcome this problem in at least two ways. First, the electronic coupon stored in the memory of the device can be re-configured to the local scanning standard. Alternatively, the coupon could be transmitted or re-transmitted to the user in the local format. In the latter case, the consumer might convert previously downloaded coupons by transmitting them to a local server that re-transmits them back to the consumer.

Fig. 1B is a simplified front view of a display 20 of a portable electronic device 10 showing a coupon 40 as a barcode. The display could be an LCD, for example, or other display suitable for use with portable electronic devices. In one embodiment, the display is an LCD with a nominal minimum dimension of about 10-13 mils (0.25-0.33 mm) and an inter-pixel spacing less than or equal to about 10% of the nominal minimum dimension. The maximum inter-pixel spacing is generally maintained in both the X and Y directions of the display because bar elements of the code are typically made from a number of vertically aligned pixels. The inter-pixel spacing does not need to be equal in all directions.

Conventional cell phones often have displays with much coarser resolution because the information to be displayed usually consists of alphanumeric characteristics adaptable to block pixel presentation. In other words, the alphanumeric characters are generated by darkening pixels within a character block. Each character block is basically rectangular in shape, and may have 8 X 7 pixels in each block, each pixel having a width equal to the width of a character vertical element for example, or a finer pitch display may generate characters out of smaller pixels. The characters are generally intended for viewing, and thus relatively large, bold characters are preferred. However, the lines of a bar code, for example, can be much finer than characters that are intended to be viewed by the user.

10 In one embodiment of the present invention, the display is a dot-matrix display of 200 X 200 pixels. The pixels have an aspect ratio of 1.5:1 (height : width) with a nominal minimum dimension of about 13 mils. The inter-pixel spacing is less than about 1.3 mils in both the X and Y directions. In another embodiment the pixels have an aspect ratio of about 3:1. It is possible to fabricate LCDs with dots (pixels) as small as about 150 X 50 microns
15 with inter-pixel spacings of about 5 microns, which is adequate for barcode scanning.

However, dot-matrix LCDs are typically strobed to avoid needing to provide a drive circuit for each pixel. Strobing can interfere with the scanning operation because the pixel value might change during scanning. For example, a pixel is darkened on a first strobe signal, but is not scanned until just before the second strobe signal, wherein the pixel has
20 relaxed to a lighter state. The lighter state might not provide the desired contrast between light and dark regions, thus leading to scanning errors. With conventional portable electronic devices that are meant to be viewed with the human eye, the eye usually compensates for the darkness variation arising from strobing.

There are at least two approaches to overcoming the strobe problem. The first
25 is to strobe the LCD at a high rate so that the pixel never has a chance to relax to an undesired state. The other is to provide a persistent pixel that retains its darkened state until the next strobe. Typical strobe rates are around 100 mS, but this rate is exemplary only. Normally, quick response and quick relaxation of the liquid crystals are desired to provide a display that changes quickly; however, in some embodiments of the present invention it is desirable to use
30 a liquid crystal that relaxes relatively slowly. Another way to maintain pixel darkness between strobe signals is to provide a local storage capacitor in parallel across each pixel to

maintain an adequate voltage across the liquid crystals. Thus, the pixel state persists at an adequate contrast level between strobe voltages.

The display resolution required to generate a scannable coupon depends on the scanner system being used, and may also depend on the available size of the display. For example, if the display size is fairly limited, for example 30 mm X 25 mm display on a cell phone or a 30 mm X 10 mm display on a pager, a high resolution display may be required to present the entire bar code. Similarly, a high resolution display may be required to allow scanning by some types of devices, such as light pens or charge-coupled diode ("CCD") array devices.

A contrast-enhancing coating 42 is applied to the display area to improve contrast between spaces and bars in the code and to increase the first scan rate ("FSR") and to reduce the substitution rate when reading the bar code. The contrast-enhancing coating may include an anti-reflective coating, in addition to other coatings, and may be formed directly on the LCD module, or on a cover. If the display of the portable electronic device includes an active backlight, the contrast-enhancing coating may include a gray filter, for example. In some portable devices, particularly cell phones, the case of the cell phone includes a clear plastic window covering the LCD display module. Reflected light off the window can interfere with some scanners, thus the addition of an anti-reflective or other contrast-enhancing coating is particularly desirable with these devices. The coating can be formed directly on the window or LCD module, or can be applied to an adhesive film, which is then applied to the window.

In one embodiment, the display is a supertwisted nematic ("STN") LCD, which provides high contrast between the light and dark portions of the scannable code over a relatively large viewing angle. It is desirable that the display provides a contrast of 1:4 between the light and dark regions of the scannable code. In another embodiment, the display is a thin-film transistor ("TFT") LCD display. It is further desirable that the entire display area be available for other uses when not displaying a barcode. In other words, a portion of the display is not relegated only to displaying bar codes because of the nature of the display elements in that region. Some conventional displays have elongated pixels especially designated for forming bar codes, for example. Those elongated pixels may not be suitable for displaying other information in the region of those pixels.

In another embodiment, the display is an LCD with a nominal minimum dimension of about 25 mils (0.64 mm). Larger displays may operate with reduced resolution limits. For example, a PDA with a display measuring 125 mm X 75 mm could produce a larger bar code label with lower resolution, suitable for reading with a laser scanner of the type often found in grocery stores or similar retail outlets. In addition to the bar code or other computer-readable coupon information, the display optionally displays text identifying the coupon.

Fig. 2A is a simplified flow chart of a coupon configuration process 200 according to an embodiment of the present invention. Coupon information is received (step 202) by the portable electronic device. The coupon information is received in a format allowing display generation, such as wireless application protocol ("WAP"), hand-held device markup language ("HDML"), or other format. The received coupon information is processed by the processor to construct the electronic coupon (step 204), and generates the coupon on the display (step 206).

Fig. 2B is a simplified flow chart of a coupon configuration process 210 according to another embodiment of the present invention. Coupon information from a coupon issuer is encrypted at a server (step 212) and sent to a handheld device using a wireless modem or similar technology (step 214). In one embodiment, the issuer checks a user code stored in the portable electronic device before sending the coupon information.

The coupon information contains both product and user information such as a serialized identification number and/or offer code, but could contain subsets of information, such as product information only. Using encrypted information is desirable to avoid having the user tamper with the discount rate, for example, and to avoid "masquerading", such as when an unintended recipient tries to use the coupon. Such masquerading often occurs with employees at the POS. The barcode information is then decrypted (step 216) in the handheld device and used to construct the electronic coupon (step 218). The coupon may be saved in local memory (step 220) and recalled (step 222) before being generated on the display (step 224). Alternatively, the decrypted coupon information could be stored, and the electronic coupon generated and displayed later. The electronic coupon and/or coupon information could be recalled in response to user entry, for example, such as in response to a button or keypad input.

Optionally, the issuer is linked to a computer at the POS and is automatically notified (step 226) that the coupon was used, and a second transmission from the server to the handheld device deletes the coupon from the memory of the handheld device (step 228).

Alternatively, the computer at the POS queries the issuer to verify that the coupon is valid. In another embodiment, user information is stored locally in the handheld device and combined with the transmitted coupon information to render a scannable coupon having both product and user information. In another embodiment, the coupon information includes a date of expiration code and the coupon information is automatically deleted from the portable electronic device after an expiration date.

In a further embodiment, the handheld device converts the selected scannable format to an alternative scannable format. For example, the coupon might be rendered to the display in UPC Coupon Code format, whether the coupon is generated on the display essentially directly from the transmitted signal, or is decrypted or otherwise locally rendered to the display, and then selectively or automatically converted to UCC/EAN-128 .

Fig. 2C is a simplified flow chart of a process for storing and recalling coupon data 250 in a data file according to an embodiment of the present invention. The data file stores coupons according to issuer, redeemer, or POS, so that each coupon relating to an issuer or to be used at a particular POS, for example, is linked and may be recalled and displayed in a serial fashion. Coupon information containing redemption identification is received (step 252) and processed, such as by decryption or other processing, to identify the issuer, redeemer, POS, or similar entity (step 254), then the coupon information is stored in a date file relating to how the coupons will be redeemed (step 256). The coupons may be redeemed in a serial fashion by recalling and displaying one coupon in a data file (step 258). Upon user entry (step 260), such as stepping with an arrow key, the next coupon in that data file is displayed (step 262).

Fig. 2D is a simplified diagram of a data file structure in accordance with the process illustrated in Fig. 2C. The data file 32 contains subfiles 50, 52, 54, each subfile being associated with coupon redemption. Thus, each subfile contains various data fields 56, 58, 60 relating to coupons from or otherwise relating to that issuer or redeemer.

Fig. 3 is a simplified flow chart of a process for redeeming a coupon 300 according to an embodiment of the present invention. Coupon information is transmitted

from a server to a portable electronic device (step 302). The portable electronic device generates a scannable coupon on a configurable display (step 304) from the coupon information. The displayed coupon is scanned by a POS computer (step 306) to automatically enter the coupon value into the POS computer.

- 5 While the invention has been described above in relation to specific embodiments, the details provided are illustrative and not restrictive. Other changes and modifications may be or become apparent to one of skill in the art, and it is desired that such changes and modifications that fall within the invention be protected.

What is claimed is:

- 1 1. A configurable portable electronic device comprising:
2 a receiver configured to receive a wireless transmission containing coupon
3 information;
4 a processor electronically coupled to the receiver;
5 an electronic display coupled to the processor;
6 a memory containing a computer-readable program, the processor reading the
7 computer-readable program to generate a scannable coupon code from the coupon
8 information on the electronic display.
- 1 2. The configurable portable electronic device of claim 1 wherein the electronic
2 display has a nominal minimum dimension of less than about 13 mils and an inter-pixel
3 spacing of less than about 1.3 mils.
- 1 3. The configurable portable electronic device of claim 1 further comprising a
2 contrast-enhancing coating disposed on the electronic display.
- 1 4. The configurable portable electronic device of claim 3 wherein the contrast-
2 enhancing coating is an anti-reflective coating.
- 1 5. The configurable portable electronic device of claim 1 wherein the memory
2 further contains a data file storing coupon information.
- 1 6. The configurable portable electronic device of claim 5 wherein the data file
2 includes a plurality of subfiles, at least one of the plurality of subfiles containing a plurality of
3 coupon data fields, each of the coupon data fields in the subfile being related according to
4 redemption.
- 1 7. The configurable portable electronic device of claim 5 wherein the coupon
2 information is encrypted and the computer-readable program contains instructions executable
3 by the processor to decrypt the coupon information.

1 8. The configurable portable electronic device of claim 1 wherein the computer-
2 readable program contains instructions for converting a coupon from a first coupon format to
3 a second coupon format.

1 9. The configurable portable electronic device of claim 1 wherein the electronic
2 display is a dot-matrix liquid crystal display.

1 10. The configurable portable electronic device of claim 9 wherein the electronic
2 display is a super-twist liquid crystal display.

1 11. The configurable portable electronic device of claim 9 wherein the dot-matrix
2 liquid crystal display includes a plurality of storage capacitors, each of the plurality of storage
3 capacitors associated with each of a plurality of pixels in the dot-matrix liquid crystal display,
4 the storage capacitors increasing the persistence of the pixels after a strobe voltage is applied
5 to the pixels.

1 12. The configurable portable electronic device of claim 1 wherein the electronic
2 display is a dot-matrix liquid crystal display having pixels capable of maintaining a contrast
3 ratio of at least 1:4 between a light portion of a bar code and a dark portion of a bar code
4 displayed on the electronic display between a first strobe signal and a second strobe signal to
5 the pixels.

1 13. A configurable portable electronic device comprising:
2 a receiver configured to receive a wireless transmission containing coupon
3 information;
4 a processor electronically coupled to the receiver;
5 a persistent dot-matrix liquid crystal display having a minimum nominal dimension of
6 less than or equal to about 13 mils and an inter-pixel spacing of less than or equal to about 1.3
7 mils coupled to the processor;
8 a memory containing a computer-readable program, the processor reading the
9 computer-readable program to generate a scannable coupon code from the coupon
10 information on the electronic display.

- 1 14. A method for providing a redeemable coupon, the method comprising:
2 receiving coupon information over a wireless link with a portable electronic device;
3 processing the coupon information in the portable electronic device; and
4 generating a scannable coupon on a display of the portable electronic device.
- 1 15. The method of claim 14 wherein the scannable coupon is a barcode.
- 1 16. The method of claim 14 further comprising steps, before the receiving step, of:
2 encrypting coupon information; and after the receiving step,
3 decrypting coupon information.
- 1 17. The method of claim 14 wherein the coupon information includes user
2 information.
- 1 18. The method of claim 14 further comprising, between the receiving step and the
2 generating step, steps of:
3 saving the coupon information in local memory; and
4 recalling the coupon information from local memory.
- 1 19. The method of claim 18 further comprising steps, after the generating step, of:
2 entering a step command;
3 recalling second coupon information from local memory; and
4 generating a second scannable coupon on the display of the portable electronic
5 device.
- 1 20. The method of claim 14 further comprising, after the step of receiving the
2 coupon information, of
3 recalling user information from a memory of the portable handheld device,
4 wherein the generating step includes combining the user information with the coupon
5 information to generate the scannable coupon with user information.
- 1 21. A method for redeeming a coupon, the method comprising steps of:
2 transmitting coupon information to a portable electronic device;

4 electronic device; and

5 scanning the scannable electronic coupon on a redemption computer.

ABSTRACT

CONFIGURABLE ELECTRONIC REDEEMABLE COUPON

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A scannable coupon, such as a bar code, is generated on a configurable display of a portable electronic device, such as a personal digital assistant, handheld computer, or mobile telephone. The display has sufficient resolution and contrast to be scanned at a point-of-sale computer for redemption of the coupon. In a further embodiment, generic coupon information is sent to the portable electronic device, which can generate a scannable coupon in any one of several formats. In another embodiment, coupon information is sent in one format and the portable electronic device converts it to another format. In yet a further embodiment, a number of coupons are stored in a data structure according to a redemption characteristic, and may be serially displayed according to user input, such as pushing a step

10

15 key.

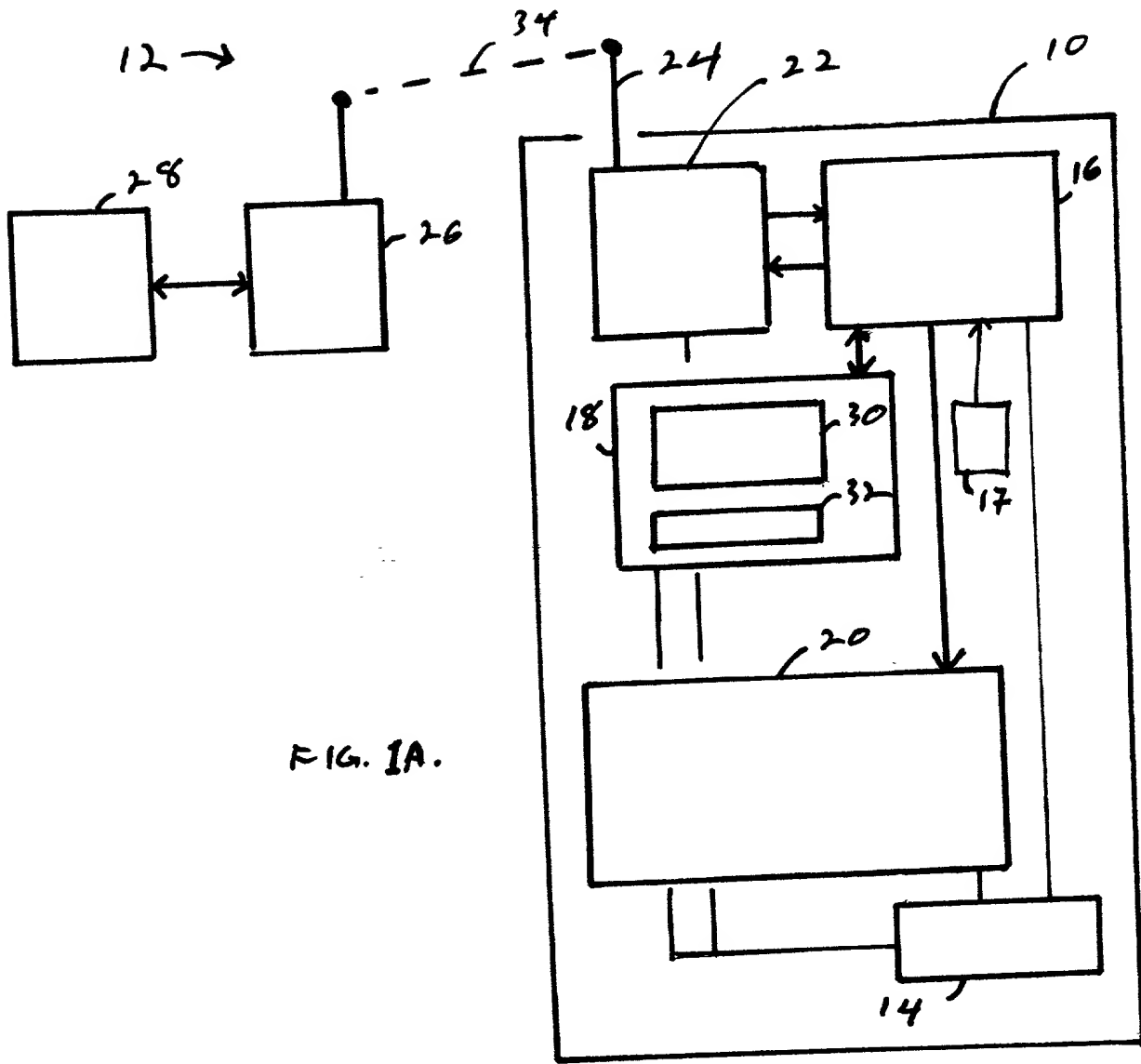


FIG. 1A.

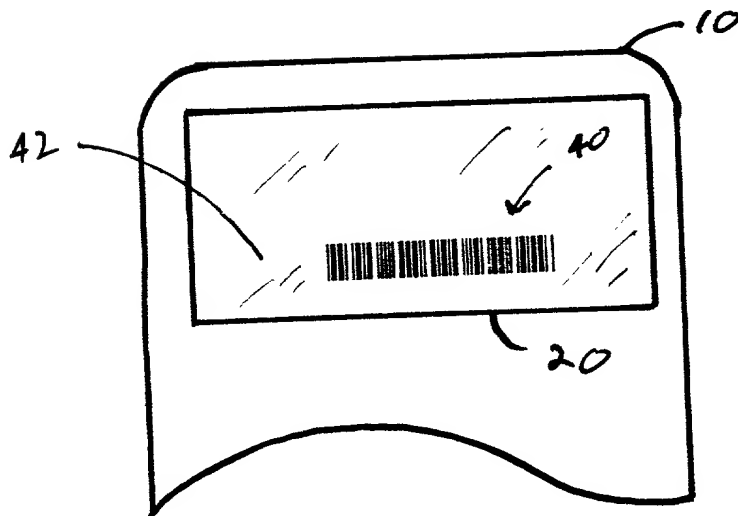


FIG. 1B.

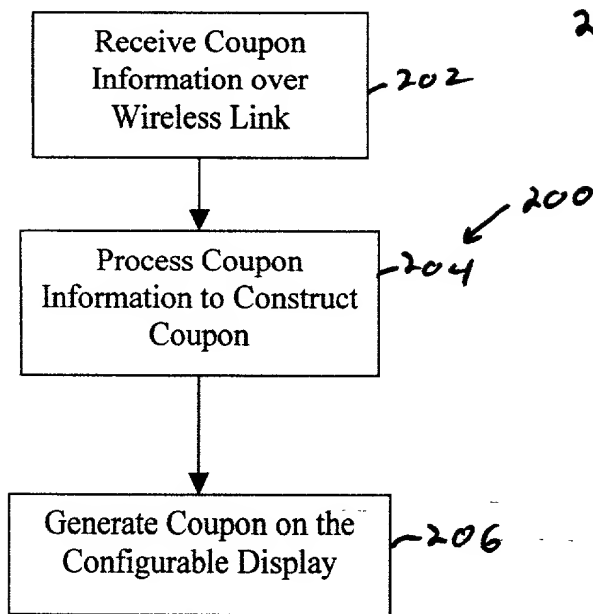


FIG. 2A.

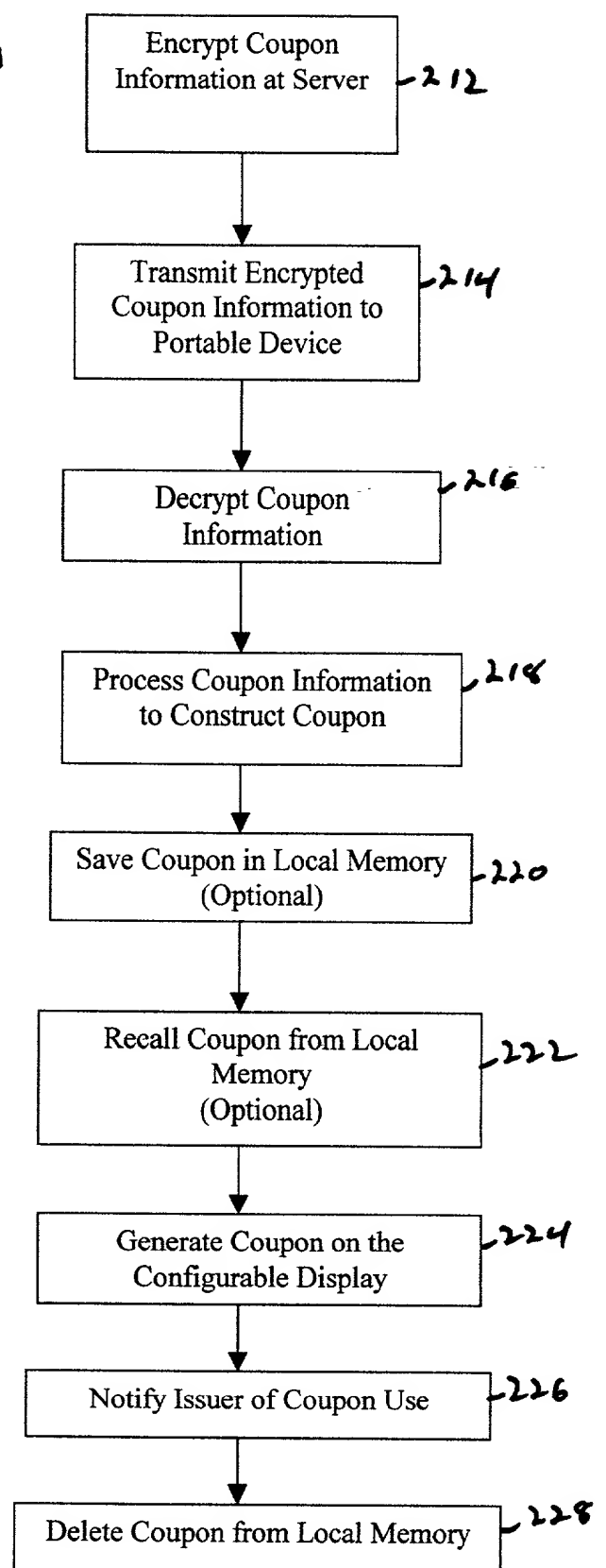


FIG. 2B.

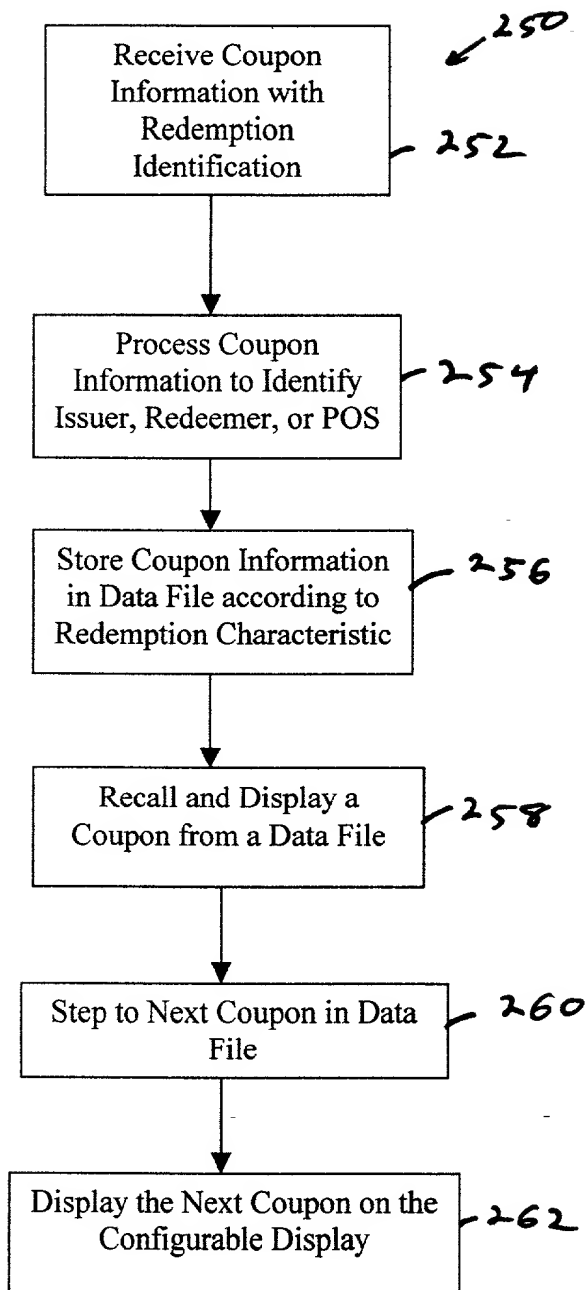


FIG. 2C.

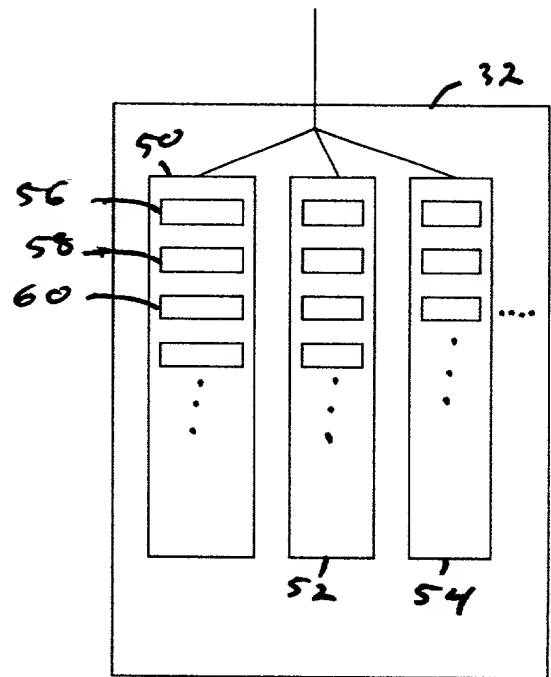


FIG. 2D.

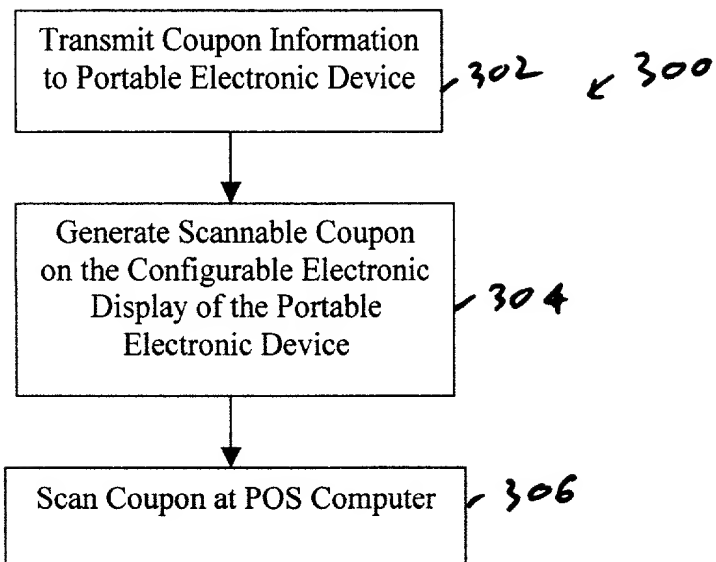


FIG. 3.

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the specification of which (Title of the Invention)

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Given Name (first and middle if any)		Family Name or Surname					
Patrick Siu-ying		Hung					
Inventor's Signature			Date	7/26/00			
Residence: City	Saratoga	State	CA	Country	USA	Citizenship	US
Post Office Address	19291 De Havilland						
Post Office Address							
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